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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/214,708	01/11/1999	MITSUSHI ITANO	XI/P6217USO	8306

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EXAMINER

SMETANA, JIRI F.

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 05/08/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/214,708

Applicant(s)

ITANO, MITSUSHI

Examiner

Jiri F. Smetana

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 March 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 6-10 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6 and 7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

**DETAILED ACTION**

***Election/Restrictions***

1. Amended claim 10 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Applicant has elected the invention directed to a chamber cleaning method. A chamber cleaning gas is distinct from a method of cleaning a chamber as described below:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

Group I, claims 6 and 7, drawn to a method.

Group II, claim 10, drawn to a gas.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Claim 10 requires the special technical feature of at least one monomer gas of He, Ne, Ar, H<sub>2</sub>, or O<sub>2</sub>. This special technical feature is absent from claims 6 and 7.

2. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 10 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03. Restriction is required under 35 U.S.C. 121 and 372.

*Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 6 and 7 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, claim 6 attempts to introduce new matter with the limitation: "during CVD processing". Nowhere in the original specification or original claims is there a mention of cleaning a CVD chamber under cleaning conditions and removing by products formed on the chamber "during CVD processing." Dependent claim 7 is also rejected because it is dependent upon rejected independent claim 6.

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gabric et al., U.S. Pat. No. 5,281,302, in view of Sony Corp., JP 04-346428.

Gabric discloses a chamber cleaning method by treating a plasma CVD chamber of a semiconductor integrated circuit production device under chamber cleaning conditions with a gaseous mixture of at least one fluorinated carbon, or any other similar fluorine containing gases

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(column 2, lines 3-5), and oxygen (column 2, lines 27-44), thereby removing by products formed on the chamber during CVD processing (column 1, lines 8-11; column 1, line 59 - column 2, line 2; column 3, line 5-7).

Gabric does not disclose the use of  $\text{CF}_3\text{CFCF}_2$  gas. However, Sony Corp. discloses the use of  $\text{CF}_3\text{CFCF}_2$  unsaturated gas (column 7, line 46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to claim a method as disclosed in Gabric in combination with Sony Corp. because Sony Corp. teaches that dry etching in the preparation of semiconductor devices with a variation of unsaturated gases with the basic formula of  $\text{C}_x\text{F}_y$ , where  $x=2$  or more and  $y=2x$  or less, but preferably  $\text{CF}_3\text{CFCF}_2$  (hexafluoropropylene) gas, because the type and number of bonds are not specifically limited and may be tailored to desired etching results (column 5, lines 30-50). The reference of JP 04-346428 by itself teaches Applicant's method of "treating a plasma CVD chamber" with  $\text{CF}_3\text{CFCF}_2$ .

### ***Response to Arguments***

7. Applicant's arguments filed 11 March 2002 have been fully considered but they are not persuasive.

8. Applicant argues that claims 6 and 7 are not anticipated by Sony Corp. because Sony Corp. fails to disclose a CVD chamber. However, reaction chambers are generally designed for plasma enhanced deposition. Therefore, it is to be expected that the chamber disclosed in Sony Corp. would be used as a reaction chamber and a deposition chamber. Examiner withdraws the rejection of claims 6 and 7 as being anticipated by Sony Corp. because Sony Corp. fails to teach

removing by products formed on the chamber during CVD processing. However, as mentioned above, this limitation constitutes new matter.

9. Applicant argues that ozone/oxygen is a crucial component for cleaning and that Gabric fails to teach that fluorinated carbon could work as a cleaning gas. However, Applicant's claims recite that transitional phrase "comprising" and is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997). Therefore, Applicant's claims do not exclude ozone or oxygen from the cleaning gas. Further, Gabric does clearly teach a fluorinated gas CF<sub>4</sub> and C<sub>2</sub>F<sub>6</sub> (abstract; column 2, lines 43-44).

10. Applicant argues that it would not have been obvious to combine an etching method with a cleaning method since etching and cleaning methods are considered complete different procedures and are generally not conducted in the same manner. However, as recited in the previous Office action, Gabric clearly recites that plasma cleaning of a CVD chamber is done by plasma etching, wherein "etching" and "cleaning" occur concurrently (column 1, lines 6-11, 59-62; column 3, lines 4-6). Further, Applicant admits that the target in "etching" is mainly SiO<sub>2</sub> (page 2, line 9) and that the target in "plasma cleaning" is also SiO<sub>2</sub> (page 2, line 22). In response to this admission, there is no difference between a target in "etching" or a target in "plasma cleaning" because they are both composed of the same material/substance.

11. Applicant also argues that the electric field accelerates electrons in the plasma that collide with molecules to form fluorine radicals, that ions in a plasma are not supplied enough energy to move around for etching or cleaning, and that disassociation of molecules would be more appropriate called a "physical reaction/phenomenon". However, this argument is a mere

conclusion without factual support. The reason for requiring evidence in declaration or affidavit form is to obtain to assurance that any statements or representations are correct, as provided by 35 U.S.C. 25 and 18 U.S.C. 1001. *Ex parte Gray*, 10 USPQ2d 1922, 1928 (Bd. Pat. App. & Inter. 1989). Further, basic properties or utility must be disclosed in Applicant's application in order for affidavit evidence of unexpected properties to be offered, unless that advantage would inherently flow from what was originally disclosed in the specification. *In re Zenith*, 142 USPQ 158 (CCPA 1964). Applicant's specification is completely silent as to the above properties.

12. Applicant argues that cleaning by ions would hardly happen under Sony Corp. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

13. Applicant argues conditions in etching are set to form fluorocarbon free radicals or ions and to avoid fluorine radicals as much as possible, and the conditions in cleaning are set to form fluorine free radicals as much as possible. However, as mentioned above, since both cations and fluorine free radicals are present in the CVD chamber, both "etching" and "plasma cleaning" take place at the same time, as supported by Gabric. Applicant fails to provide anywhere in the specification or claims any sort of process parameters such as flow rate, temperature, concentrations, etc., or any limitations that the chamber "plasma cleaning" is a result of fluorine free radicals (F<sup>•</sup>). So long as some fluorine free radicals are present in the CVD chamber, some degree of cleaning will take place.

***Response to Amendment***

14. Amended claim 10 is withdrawn as being drawn to a nonelected invention.
15. Rejection of claims 6 and 7 is maintained and deemed proper.

***Conclusion***

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jiri F. Smetana whose telephone number is (703)605-1173. The examiner can normally be reached on Monday-Friday (7:30am-4:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703)608-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

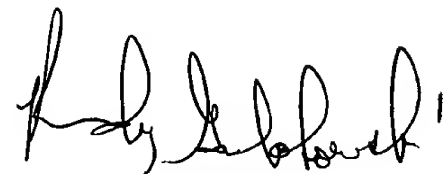


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

Jiri F. Smetana  
Patent Examiner  
Art Unit 1746

jfs  
May 3, 2002

A handwritten signature in black ink, appearing to read 'Randy Gulakowski', with a stylized, cursive script.

RANDY GULAKOWSKI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700